

## **IMPLICATIONS OF THE NRC FRAMEWORK FOR STANDARDS, CURRICULUM AND INSTRUCTION, AND ASSESSMENT**

*A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas* developed by the National Research Council (NRC, 2012) presents elements of a vision for contemporary science education. The *Framework* is the basis for standards that should be understandable, manageable, and useable. Several characteristics have clear implications for state and local policies, school programs, and classroom instruction. Following are several key concepts from the NRC *Framework*. Working with a colleague, first discuss the concepts and then briefly describe the implications for standards (policies), curriculum and instruction, and assessment.

The NRC *Framework* provides guidance for the development of standards. The following summarizes key points from the NRC recommendations.

Standards for K-12 science education should

- Set rigorous goals for all students.
- Be scientifically accurate.
- Be limited in number.
- Emphasize all three dimensions.
- Include performance expectations that integrate all three dimensions.
- Be informed by research on learning and teaching.
- Meet the diverse needs of students and states.
- Have a coherent progression across grades and within grades.
- Be explicit about resources, time, and teacher expertise.
- Align with *Common Core State Standards*.
- Account for diversity and equity. (NRC, 2012, pages 297-307)

## Integration of Content and Practices

Key Ideas from NRC Framework	Implications for Standards	Implications for Curriculum and Instruction	Implications for Assessment
<p>Inclusion and incorporation of practices is a guiding principle based on extensive research.</p> <ul style="list-style-type: none"> <li>• “Engaging in the practices of science helps students understand how scientific knowledge develops; such direct involvement gives them an appreciation of the wide range of approaches that are used to investigate, model, and explain the world.”</li> </ul>		<ul style="list-style-type: none"> <li>• “Participation in these practices also helps students form an understanding of the crosscutting concepts and disciplinary ideas of science and engineering; moreover, it makes students’ knowledge more meaningful and embeds it more deeply into their worldview.”</li> </ul> <p>(See p. 42)</p>	

**All Standards, All Students  
(Diversity/Equity)**

Key Ideas from NRC Framework	Implications for Standards	Implications for Curriculum and Instruction	Implications for Assessment
<p>“All standards, all students” is a guiding principle, based on extensive research.</p> <p>“...the framework is designed to be a first step toward a K-12 science education that will provide all students with experiences in science that deepen their understanding and appreciation of scientific knowledge and give them the foundation to pursue scientific or engineering careers if they so choose. A growing evidence base demonstrates that students across economic, social, and other demographic groupings can and do learn science when provided with appropriate opportunities.” (See p. 298)</p>			